

## Harbor Connections— Field Lesson

### 7<sup>th</sup> Grade Micro-Wilderness

### Overview:

In this lesson, students explore the micro-wilderness and learn about adaptations of insects, arachnids, and other invertebrates and how these organisms are affected by their environment and vice versa. Students learn how to properly use entomological collection tools.

### Massachusetts State Standards:

- Mental Health; Interpersonal Relationships; Violence Prevention; Ecological Health (Comprehensive Health 5, 7, 11, 13)
- Discussion; Questioning, listening and contributing; Oral presentation; Vocabulary and concept development (English Language Arts 1,2,3,4)
- Classification (Life Science 1)
- Food Web (Life Science 14)
- Living things and their Environment (Life Science 13)
- Decomposition (Life Science 15)

### Setup and Cleanup:

- Check and replenish contents of Bug Kits
- Scout the location in advance to determine the boundaries of exploration and any safety hazards.
- **After Lesson:** count and refill kits, make sure that everything is clean and dry.

### Materials:

- 2 or more beating sheets
- Extra pencils
- Insect field guide(s)
- Straws for aspirators
- Per Student Group of 2-3
  - 1 Bug Kit containing
    - 5 vials
    - 1 safari cup
    - 1 aspirators
    - 1 Boston Harbor Islands Micro-wilderness ID sheet
    - 1 Common Invertebrate Groups ID Sheet
    - 1 hand lenses
    - 1 white viewing tray
    - 1 Butterfly nets

### Learning Experiences for 60 Minute Session (*minimum*)

<b>Experience</b>	<b>Time</b>
Introductory Circle, Agenda, Review of Class, scope the site, Intro Tools	10
Split into groups and Explore	20
Identify and draw/write	20
Cleanup and release	5
Closing circle	5

### **Concepts:**

- There is a great biodiversity of small invertebrates on Thompson Island
- Insects are the most diverse group of animals on the planet because they are able to adapt to their environment in so many different ways.
- Insects are affected by their environment
- Adaptations are physical characteristics or behaviors that help a species of insect survive in its environment
- Invertebrates occupy different important roles in the food web

### **Key Vocabulary:**

**Entomologist**  
**Adaptation**  
**Feeder Groups**  
**Decomposer**  
**Carnivore**

**Herbivore**  
**Pollinator**  
**Organism**  
**Species**  
**Habitat**

### **Learning Targets:**

Work in collaborative groups

Collect and identify at least three invertebrates

Describe the adaptations of one invertebrate in detail

Make connections between the adaptations of an invertebrate and its environment.

### **Introductory Circle (10 Minutes)** **Led by Curriculum Specialist/Ranger**

- 1. Agenda: give a rundown of the program**
  - a. Review from class, and scoping the site
  - b. Intro to tools
  - c. Split into groups
  - d. Exploration Time
  - e. Regroup, Identify
  - f. Draw or write, cleanup and release
  - g. Share

## 2. Review and scoping the site

Start with a quote or hook statement about biodiversity or insects on Thompson Island.

*Quote: If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos.*

E. O. Wilson

Funfacts:

- Over 90% of all animals on the planet are insects.
- Most fruit and vegetables need insects to be able to make fruit – i.e. apples, onions, mangos, watermelons.

## 3. Intro to Tools

Explain the use of tools, mention that they are the same type of tools that were used by entomologists and students to collect the specimens they examined during the classroom session. Each kit has a specific number of materials, and all materials must be replaced at the end of the lesson just like you found them.

- 10 vials make sure to keep track of caps, try to put only one specimen in at a time to minimize stress
- 2 safari cups – use for larger insects such as butterflies or caterpillars, and to take a closer look. Be careful of scratches.
- 2 aspirators – use a straw to assure it is hygienic. Suck through rubber hose end and suck bug into metal tube. Make sure that a filter is on the other end of the rubber hose so that insects can't get into your mouth by accident!
- 1 Boston Harbor Islands Micro-wilderness ID sheet – use for identification
- 2 hand lenses – use for identification and drawing
- 1 white viewing tray – easier to take a close look at crawlers on a white background.
- Butterfly nets – catch flying insects or sweep through grass to catch things living in the grass. Do not use in rose bushes or blackberries with all of the thorns.
- Beating Sheet – use to collect insects from tree branches. Assemble, have one person hold under a tree branch, while another person shakes the branch.

## Explore (20 Minutes)

### Led by instructor and ranger

1. Split into groups of 3-4 (or ask facilitators to do so)

Explain that groups must stay together, and that there are several roles within these groups: Collector, recorder, trapper, identifier.

## **2. Boundaries/Time**

Set out physical boundaries for exploration, remind of 100% sight and sound.

Facilitators should accompany a specific group if necessary, or split up to adequately monitor the entire area of exploration.

### **Regroup/Identify (20 min)**

Encourage students to stay on task with identification, and collect butterfly nets or distracting tools if necessary. Facilitators work with groups, and call over curriculum specialist to help answer questions or to help with further research using the field guide about something that was caught.

Guide students in answering questions and thinking about where they found the invertebrates, what their behavior is like, what feeder group they are in, and in forming detailed descriptions of physical characteristics.

### **Clean Up/Release (5 Minutes)**

1. Release all living things in a similar environment to which they were found.
2. Clean up any disturbance to area, such as overturned rocks.
3. Reassemble bags of supplies and count materials from each group.

### **Circle/Debrief (5 Minutes)**

1. Circle up
2. Ask a discussion question: What did you find? Where do you think is the best place to find certain types of insects and invertebrates? What are some things you wonder about the living things you found today? If you were to design an insect to live in this environment, what would it look like?